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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/599,523

09/29/2006

Sang Jun Youn

4146-00500

1302

30652

7590

06/19/2009

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EXAMINER

DUCHENEAUX, FRANK D

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

06/19/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,523	Applicant(s) YOUN ET AL.	
	Examiner FRANK D. DUCHENEAUX	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 11-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/21/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-10, in the reply filed on 4/20/2009 is acknowledged.
2. Claims 11-39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 4/20/2009.

Specification

3. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The **abstract should not refer to purported merits or speculative applications** of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;

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(4) if a mixture, its ingredients;

(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

4. The abstract of the disclosure is objected to because it refers to both the purported merits of the invention and the speculative applications in the first sentence. Correction is required.

See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities: The examiner requests that applicants maintain consistent labeling, via reference numbers, when portions of the drawings are mentioned in the disclosure. See page 30, lines 7-8, for the "continuous reinforcing fiber-impregnated prepreg."

Appropriate correction is required.

6. The disclosure is objected to because of the following informalities: The word hollow, as in hollow beads, on pages 14 and 15, is misspelled.

Appropriate correction is required.

7. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "43" and "44" have both been used to designate a molded article (see page 29, for example). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "41" has been used to designate both "molding machine" and "mold" (see page 31, for example). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. **Claims 1, 5-6 and 10**, are rejected under 35 U.S.C. 102(b) as anticipated by Sakai et al. (US 5294394).

Regarding claim 1, 5-6 and 10, Sakai teaches preparation of fiber-reinforced thermoplastic molded articles (title) comprising a laminate (column 9, line 47) of a plate material (center layer) essentially consisting of a thermoplastic resin and fibrous reinforcement (thermoplastic composite material), and a sheet (continuous layer) prepreg obtained by impregnating a unidirectionally (mono-directional structure) arranged fiber with a thermoplastic resin (column 5, lines 9-13), said sheet prepreg is set up on either one or both of the surface (upper and lower surface) and the back of the plate material (column 5, lines 49-50) and said prepreg layer having a reinforcing fiber content of 30 wt. % - and thereby 70 wt. % of a thermoplastic resin (Table 2, prepreg E and Example 8). Sakai also teaches that prescribed numbers of the sheet prepreg are stacked (outermost prepreg sheet serving as a protective layer) in an arbitrary portion on the sheet material and that the sheet material is maintained above the flow temperature (melted) of the thermoplastic resin and then placed in a in a mold and pressed (adhered) for a short time to

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carry out foaming, defoaming and cooling and that the resin in the plate material is the same as that of the prepreg (column 5, lines 37-48). Sakai continues to teach a plate material made of a thermoplastic resin with a fibrous reinforcement of a glass fiber (glass fiber-reinforced thermoplastic resin layer) (Table 1, plate material (b) and Example 8).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. **Claims 2 and 8**, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. (US 5294394) in view of Funakoshi (US 2003/0161989 A1).

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Regarding claims 2 and 8, Sakai teaches the fiber-reinforced thermoplastic molded articles as in the rejection of claim 1 above. Sakai also teaches fibers of about 2 inches (about 50.8 mm) in length (column 2, lines 56-58) and a plate material with a fibrous reinforcement content of 30 % by weight (Table 1, plate material (b) and Example 8). Sakai fails to teach fibers with an average length of 1-30 mm.

However, Funakoshi teaches a lightweight fiber-reinforced thermoplastic resin molding (title) comprising fibers of an average length of 2 mm to about 10 mm (para 0040) and that tensile and bending strength tend to be greater as the length of reinforcing fibers increases (para 0039).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the fiber-reinforced thermoplastic plate material as taught by Sakai with fibers of a length of 2 to 10 mm as taught by Funakoshi towards fiber-reinforced thermoplastic molded articles with tensile and bending strengths commensurate with the application for which the articles are to be used as in the present invention.

15. **Claims 3 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. (US 5294394) in view of Nagayama et al. (US 6749934).

Regarding claims 3 and 9, Sakai teaches the fiber-reinforced thermoplastic molded articles as in the rejection of claim 1 above. Sakai fails to teach a center layer comprising 15-30% by weight

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of inorganic filler, said filler selected from the group consisting of calcium carbonate, hollow beads, talc, mica, wollastonite, zinc sulfide and activated carbon.

However, Nagayama teaches an FRP molded article and method for producing the same (title), comprising a mixture of thermoplastic resin and reinforcing fibers (abstract) and a filler such as needle-like calcium carbonate (inorganic filler)(column 7, lines 43-47), wherein the needle-like filler content is 5 to 20 wt. % (column 8, lines 23-26). Nagayama also teaches a fine filler, especially a needle-like filler, inhibits local molding shrinkage and irregular stiffness, which mitigates warping (column 8, line 67 and column 9, lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the plate material as taught by Sakai with the filler material as taught by Nagayama towards a fiber-reinforced thermoplastic molded article, which is less susceptible to local shrinkage of the mold and irregular stiffness and provides a molded article with diminished warping and thereby an article with improved aesthetic appearance.

16. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. (US 5294394) in view of Bassett et al. (EP 0945253 A2).

Regarding claim 4, Sakai teaches the fiber-reinforced thermoplastic molded articles as in the rejection of claim 1 above. Sakai fails to teach a center layer comprising 20-40 % by weight of wood flour and chaff.

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However, Bassett teaches a filled composite material (title) comprising a polyolefin, glass fibers and filler (abstract), wherein said filler is a wood flour (para 0019, lines 1-2) with a content of 20 to about 40 % by weight of the composite (para 0036, line 3). Bassett also teaches that wood flour can be used for cost reduction of the composite materials.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the plate material as taught by Sakai with wood flour filler in a content as in the present claim towards a fiber-reinforced thermoplastic molded article that can be manufactured at a reduced price as in the present invention.

17. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. (US 5294394).

Regarding claim 7, Sakai teaches the fiber-reinforced thermoplastic molded articles as in the rejection of claim 1 above. Sakai also teaches suitable thermoplastic resins for the plate material include polypropylene, polyethylene, nylon, PET and polyphenylene sulfide (column 2, lines 40-48); and those resins exemplary for the sheet prepreg include polypropylene, polyethylene, nylon, PET and polyphenylene sulfide (column 3, lines 43-50). Sakai continues teaches that the prepreg has excellent adhesion of the thermoplastic resin to the reinforcing fiber and the fiber content can also be varied from 30 to 90 % by weight depending on demand (column 4, lines 9-

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12) and that the content of fibrous reinforcement in the plate material is from 30 to 70 % by weight and in view of reinforcing effects alone higher amounts are better, but a content exceeding 70 % by weight leads to flowability problems, while in view of flowability a content of 50 % by weight or less is preferred (column 3, lines 37-42). The Sakai reference further teaches examples employing nylon 6 (a polyamide) and polypropylene as the thermoplastic resin.

Therefore, given that Sakai teaches the thermoplastic resins as in the current claim, along with the % by weight distributions of the thermoplastic resin and the reinforcing fiber that overlap with the present invention, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ thermoplastic resins such as nylon 6 or a polypropylene and adjust the % weight of the resin and the fiber content to a distribution that provides a fiber reinforced thermoplastic composite sheet with application-desired flowability and reinforcing strength as in the present invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANK D. DUCHENEAUX whose telephone number is (571)270-7053. The examiner can normally be reached on M-Th, 7:30 A.M. - 5:00 P.M..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie E. Shosho can be reached on (571)272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FDD

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794